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Properties of Matter Guided Notes

I. Matter: anything that takes up _____ & has _____

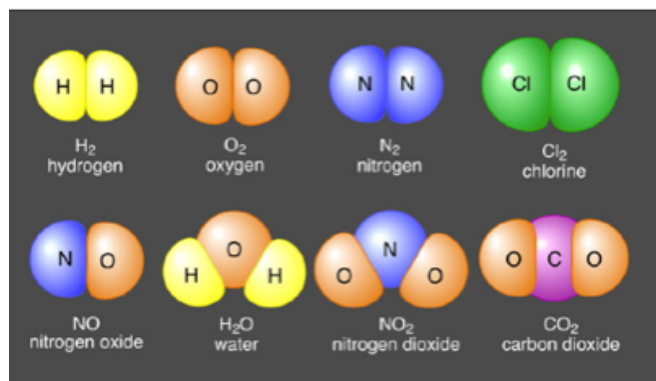
A. Types of Matter

1. Pure Substance:

- a) Element: single substance that _____ be broken down
- b) Compound: _____ or more substances / elements that can not be _____ broken down
 - (1) Molecule: The _____ particle (one or more atoms) of a compound that has all the _____ of that compound

2. Mixture: Combination of substances that can be easily _____

- a) Heterogeneous: items can be easily _____
 - (1) Suspension
- b) Homogeneous: items are _____
 - (1) Solution
 - (a) Solvent
 - (b) Solute
 - (2) Colloid



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B. Properties of Matter

1. Extensive: physical property that _____ on amount of matter _____.
 - a) Mass: amount of matter in object (measured in grams [g])
 - b) Weight: gravitational force acting on an object (measured in newtons [N])
 - c) Volume: amount of space a substance occupies (measured in liters [L] if a liquid or cubic meters [m^3] if a solid)
 - d) Length (measured in meters [m])

2. Intensive: physical properties that are _____ throughout material not matter the amount of matter _____.
 - a) Color
 - b) Odor
 - c) Luster: How _____ a substance is.
 - d) Malleability: The ability to be beaten into _____.
 - e) Ductility: The ability to be drawn into thin _____.
 - f) Conductivity: Allows the flow of free _____. Electricity can move through the material.
 - g) Hardness: How easily it is scratched.
 - h) Melting / Freezing / Boiling Point
 - i) Density

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II. Density: amount of _____ contained by a given _____

A. An object's _____ is determined by its density in relation to the density of the _____ liquid.

1. If the object is more dense than liquid = _____

2. If the object is less dense than liquid = _____

Finding DensityCalculate the density of a material that has a mass of 52.457 g and a volume of 13.5 cm³**Finding Mass**The density of silver is 10.49 g/cm³. If a sample of pure silver has a volume of 12.993 cm³ what would the mass be?**Finding Volume**Pure gold has a density of 19.32 g/cm³. How large would a piece of gold be if it had a mass of 318.97 g?

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III. States of Matter

A. Solid: _____ shape & volume

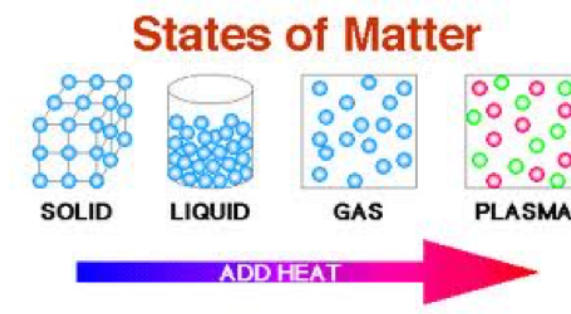
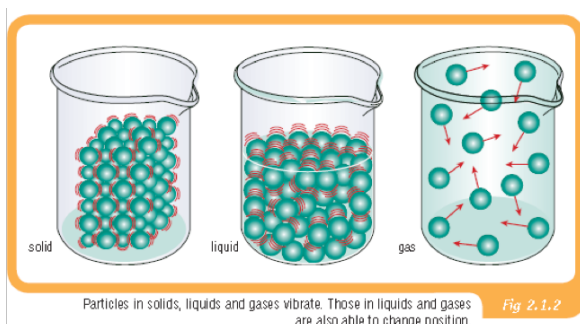
1. Particles held tightly together, and _____ in place

B. Liquid: _____ shape, definite volume

1. Particles move rapidly, allows them to overcome attractive forces between them

C. Gas: _____ shape and volume

1. Particles move fast and break away from each other. Amount of space b/t particles changes
2. Gas _____ to fill the space



D. Plasma: No definite shape or volume

1. Particles are _____ charged
 - a) Examples: lightning, fire, and aurora borealis

E. Bose-Einstein Condensates: superconductors or superfluids

1. Superconductors are materials that are cooled to almost _____ zero which result in no resistance to the flow of _____.
2. Superfluids, liquid helium, can trap light and slow the _____ of light.

IV. Kinetic Theory of Matter: matter is made of _____ that act like tiny particles in _____

A. Higher _____ of a substance = _____ the particles move.

B. At the same temperature, more _____ particles move _____ than less massive ones

V. Temperature: measure of the kinetic energy of the particles in an object

A. Particles of matter are constantly moving, but not always moving at the same speed

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VI. Energy and Changes of State

A. Identity of a substance does not _____ during a change of state, but _____ does

1. If you add energy, particles move _____.

2. If you remove energy, particles slow down

B. Kinetic Energy _____ / _____ as a material _____ / _____

C. Potential energy increases / decreases as a material goes through a _____ change.

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